TECHNICAL SPECIFICATIONS

WASHINGTON STATE FERRIES

M.V. KITTITAS DRYDOCKING

CONTRACT NO. 00-6330

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TECHNICAL SPECIFICATIONS

1. DRY DOCK VESSEL

A. M.V. KITTITAS Vessel Particulars:

Length: 328'-0", Beam: 78'-8", Draft: 16'-6", Gross Tons: 2,477

B. Provide labor, material and equipment to dry dock Vessel for cleaning, painting, inspections, the work specified herein and any necessary repairs.

C. Block spacing shall be at twelve (12) foot centers. Provide drawing to the WSF Inspector indicating the block positions used.

D. Vessel shall be docked to expose the previous docking block positions. **Attachment No. 2,** "BLOCK POSITION FORM", showing previous docking position, is provided for reference.

2. TEMPORARY SERVICE

A. Install one (1) telephone on board in a location designated by the Vessel Staff Chief Engineer. The telephone is to have one (1) outside line with toll-free access to Seattle and vicinity and, if different, one (1) line for local numbers. The telephone shall have touch tone service if available from the Contractor's telephone system.

B. Provide and maintain electricity, water, safe lighted gangway and trash removal services while Vessel is in the Contractor's facility.

C. Provide safety and security for the entire Vessel throughout the construction, repair or renovation period until such time as the WSF Representative has accepted re-delivery of the Vessel. Every reasonable precaution shall be taken to protect the Vessel from the hazards of fire, flooding, pilferage, malicious damage, and other events, including cataclysmic phenomena of nature.

D. Provide and maintain comprehensive and effective fire prevention and fire detection, and fire fighting programs and systems sufficient to ensure the safety and integrity of the Vessel. Provide personnel trained in shipboard fire fighting techniques and also trained to cooperate with and assist local fire fighting organizations. Provide sufficient shore fire hoses to ensure an adequate supply of fire fighting water, at sufficient pressure, and maintain an adequate number of tested fire-hoses aboard the Vessel to effectively fight fires at any location in the Vessel.

E. Provide and maintain portable fire extinguishers in sufficient quantity, and of the appropriate type, to combat local fires of any class. Provide sufficient fire watches, including roving watches as may be required, to ensure that fires that may be inadvertently started by welding sparks or heat, electrical malfunction, or spontaneous combustion are detected, reported and promptly extinguished.

3. SEA VALVE INSPECTION

A. Open the below listed sea valves, clean and blue as required for inspection on M.V. KITTITAS. All valves two (2) inches and under shall be replaced with new Contractor-furnished valves. Removed valves shall remain the property of the Vessel.

LOCATION	SERVICE	TYPE	SIZE
Engine Room 1	Main Sea Suction	NORRIS Butterfly	8"
Engine Room 2	Main Sea Suction	NORRIS Butterfly	8"
Engine Room 1	Fire Pump Recirculating	gate	2"
Engine Room 2	Fire Pump Recirculating	gate	2"
Engine Room 2	Sanitary supply water	gate	2"
Engine Room 1	Sea chest vent	gate	2"
Engine Room 2	Sea chest vent	gate	2"
Engine Room 1	Sea chest blow down	globe stop-check	1"
Engine Room 2	Sea chest blow down	globe stop-check	1"

B. Sea valves shall be inspected by the WSF and United States Coast Guard (USCG) Inspectors for the following:

- General material condition;
- Valve disk to valve seat contact and
- Proper mechanical operation.

C. Furnish and renew all o-rings and other components in NORRIS butterfly valves, using the NORRIS M 200 A7 repair kits.

D. Upon completion of valve overhaul, and prior to re-installation, hydrostatically test all overhauled and new butterfly valves to the satisfaction of the Vessel Staff Chief Engineer, and the WSF and USCG Inspectors.

E. After inspection, re-assemble/install valves using new valve stem packing on non-butterfly valves and new gaskets on all valve flange connections.

4. FIREMAIN VALVE REPAIRS

A. Remove eight (8) eight inch (8") Norris butterfly firemain valves.

B. Install new repair kits and hydrostatically bench test to satisfaction of the Vessel Staff Chief Engineer and the WSF Inspector.

C. Install valves using new gaskets on all valve flange connections.

D. Test system for tightness to satisfaction of the Vessel Staff Chief Engineer and the WSF Inspector.

5. ZINC RENEWAL

A. Provide labor and material to renew bolt-on zincs at the following locations:

- Port and Starboard sea chest, three (3) zinc anodes each (total of six (6) zincs);
- Under both rope guards and
- Adjacent to each keel cooler at six (6) locations, six (6) zinc anodes each (total of thirty-six (36) 25 lb. zincs).

B. Provide a sketch to the WSF Inspector showing locations and sizes of all zincs installed under this Item.

6. RUDDER INSPECTION, NO. 1 AND NO. 2 ENDS

A. Erect staging, or provide suitable personnel lifting device on both sides of the No. 1 and No. 2 End rudders for inspection.

B. Drain and pressure-test rudders for leaks in the presence of the WSF and USCG Inspectors. Test pressure shall be 42" of water, or 1.5 PSI gage pressure.

C. Take and record clearances of rudder pintle and rudder stock bearings on No. 1 and No. 2 End rudders. Submit three (3) copies of a written report of findings to the WSF Inspector.

D. Remove No. 1 and No.2 rudders to the drydock floor.

E. Disconnect the tiller and all necessary interferences and remove both rudder stocks. Transport both rudder stocks to and from a machine shop. Clean both rudder stocks and visually inspect for condition. Measure and record all bearing surfaces on both rudder stocks. Place each stock in a lathe and measure trueness.

F. Transport both pintle pins to and from a machine shop. Clean both pintle pins and visually inspect for condition. Place each pintle pin in a lathe, polish the bearing surfaces and chase the threads.

G. Fabricate and install a split ring collar on each rudder stock at a point just below the lower stock bearing to act as a water deflector. The collars shall be fabricated of nylon, Thordon, or other suitable material. The material shall be approved by the WSF Inspector and the Vessel Staff Chief Engineer prior to installation. The rudder stock at this point of installation is approximately 15 inches in diameter. Collar thickness shall be determined in the field according to the distance between the palm bolt containment and the lower bearing retaining ring. The collars shall extEnd out from the rudder stocks approximately 2 inches on each side. The collars shall be clamped in place using stainless steel fasteners.

H. Measure and record the measurements of all rudder bearings including lower and upper rudder stock bearings, pintle pin bushing, pintle pin bearing, and carrier bearing. Visually inspect all bearing surfaces for condition. Ensure proper location and operation of grease passages to carrier bearing and upper rudder bearing.

I. Fabricate from ABS Grade 2 steel and install new rudder quadrant bolts and slotted nuts.

J. Provide a written report of all conditions found above to the WSF Inspector and the Vessel Staff Chief Engineer.

K. Upon completion of all inspections and any necessary repairs, reinstall the rudder stock rudder and associated parts. Lubricate rudder bearings, and fill both rudder palm fairwaters with tallow.

L. Conduct an operational test of the steering system from each pilothouse to the satisfaction of USCG, WSF Inspector and Vessel Staff Chief Engineer.

7. PROPELLER INSPECTION, NO. 1 AND NO. 2 ENDS

A. Erect and remove staging in areas around No. 1 and No. 2 End propeller blades to accomplish all affiliated work and inspection required.

B. Polish the No. 1 and No. 2 End propellers by power disk-sanding, using 80 grit or finer abrasive. Thoroughly clean propeller blades for nondestructive testing.

C. Inspect blade palms for damage and wear.

D. Conduct a nondestructive test for surface cracks on the blades in the presence of the Vessel Staff Chief Engineer, WSF and USCG Inspectors. Submit three (3) copies of a written report of findings to the WSF Inspector. If repairs are indicated they will be subject of a change order and will be accomplished by Rolls Royce Marine, Seattle.

E. Weigh each propeller blade and stamp the weight into each blade, and the date weighed. Chisel a line through previous weighing and date stamps. Take care not to damage serial numbers and other identifying data.

8. INNER AND OUTER WAUKESHA SEAL REBUILD, NO. 1 AND NO. 2 ENDS

A. Drain No. 1 and No. 2 End inboard and outboard stern seal units. Dispose of oil.

B. Take WAUKESHA seal wear-down readings on No. 1 and No. 2 Ends in the presence of the Vessel Staff Chief Engineer and WSF Inspector. Submit three (3) copies of a written report of findings to the WSF Inspector.

C. Furnish labor, material and equipment to disconnect the No. 1 and No. 2 End inner and outer Waukesha stern tube seal assemblies and liners for a total of four seals and four liners. Employ the services of Sound Propeller Services to rebuild the four seals and liners, and to provide technical assistance for seal and liner removal and reinstallation. Provide transportation for seals and liners to and from Sound Propeller Services.

NOTE:
The Contractor is reminded of the shaft grounding assembly in the No. 1 and No. 2 End Tank Rooms which will require lifting of the grounding brushes prior to any drifting of the stern shaft assembly. Any damage caused by failure to raise the brushes and protect the assembly shall be repaired at the Contractor's expense.

D. Disconnect and withdraw the tailshaft with inner and outer oil control tubes installed. Disassembly is covered under Specification Item 20. Protect the Ends of the oil tubes and use caution to prevent dirt and debris from contaminating the tube bores. Solvent clean internal bore of the tailshaft and line shaft to the satisfaction of the Staff chief Engineer and the WSF Inspector. Clean the stern tubes and bearings to the satisfaction of the Vessel Staff Chief Engineer and the WSF Inspector, using care to protect the stern tube bearings.

E. Clean and dress the hub bolt shrouds. Mount the shrouds in a lathe and true up beveled edge, "o" ring grooves and stern tube seal mating surfaces.

F. Measure and record stern tube bearing inside diameters and tailshaft outside diameters in way of bearings. Clean and dress surfaces of stern tube bearings and tailshaft. Provide a written report of the measurements and condition of stern tube bearings to the State representative.

G. Machine seal shaft liners to achieve a 0.030-inch clearance. Insure shaft liner bolt holes allow for sufficient movement to permit proper seal alignment.

H. Provide an opening in each End the vehicle deck for removal and installation of the inner seal assemblies and close up upon completion of work. Test the insert to the satisfaction of the WSF Inspector and the USCG Inspector. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK" for same. Maintain the certificate during the course of the Work. Provide fire watches as required.

I. Align seal liners to within .005 TIR on both the face and periphery. The WSF Inspector, USCG Inspector and the Vessel Staff Chief Engineer shall witness alignment.

J. Provide labor, material and equipment to prepare to an SSPC-SP 3, Power Tool Cleaning, all areas of paint, yellow safety striping and non-skid damaged as a result of this Work Item, and coat with 6 mils (DFT) minimum of AMERON, Bar-Rust 235, followed by a topcoat of 2 mils minimum (DFT) of AMERON, Devran 229 of proper color. Replace any damaged or removed non-skid with AMERON, Devgip 237M to match the surrounding areas.

K. Reinstall control tubes and tailshaft in good order upon completion of work.

L. Fill No. 1 and No. 2 outboard WAUKESHA seals with HYPERLUBE or STP.

M. Apply two (2) coats of INTERNATIONAL Intertuf 262 Series epoxy, Red, to seal housings to obtain a minimum of 5 mils (DFT) each coat. Install a zinc anode on each seal housing.

9. NO. 1 AND NO. 2 SKF COUPLING INSPECTION

A. Prior to disassembly record the piston extension from each coupling housing.

B. Provide labor, material and equipment to disassemble No.1 and No. 2 End SKF Coupling assemblies and inspect for condition. Provide three (3) copies of report indicating conditions found. Chase threads, and clean interiors. Re-assemble using new seals.

10. NO. 1 AND NO. 2 END STERN FRAME REPAIRS

A. Provide labor, material and equipment to blank off each stern tube opening.

B. Ultra High Pressure water blast (35,000–40,000 psi) stern frames No.1 and No. 2 Ends.

C. Perform Nondestructive test on stern frame ends at stern tube openings. Provide three (3) copies of written report to WSF Inspector.

D. Provide labor, material and equipment to weld build up eroded surfaces designated by the WSF Inspector using an ABS approved welding procedure. For bidding purposes assume each stern frame will require 600 linear feet of welding. This Item will be adjusted upwards or downwards to account for the actual square footage authorized by the WSF Inspector

E. Provide labor, material and equipment Machine stern tube faces true. Chase all threads.

F. Upon completion of machining perform a Nondestructive tests on built up and machined areas. Provide three copies of written report to WSF Inspector.

G. Preservation is to be accomplished in accordance with Items 15, 16, and 17.

11. FRESH WATER WASH

PAINTING OF VESSEL AND HULL PRESERVATION

Special Note

(ATTACHMENT NO. 1)

Area Preparation, Surface Preparation, Grit Blasting, Paint Coatings, and Inspection for Vessel's hull, curtain plates, casing and superstructure shall be in accordance with Washington State Ferries Marine Coating Specification 1/01 unless otherwise specified in the following Specifications.

A. Within 24 hours upon dry-docking Vessel, provide labor, material and equipment to Low-Pressure Water Cleaning (LP WC) at 3,000 -3,500 psi in accordance with SSPC-SP 12/NACE 5. The wand shall be held no more than 12 inches from surface being washed. The entire hull from the guard to the keel, including all horizontal and vertical surfaces of the guard, flat keel, rudders, sea chests and propellers shall be washed. The wash shall leave no visible growth or residue after the hull dries from washing.

B. Remove sea chest strainer plates prior to pressure-wash, and re-install strainer plates using new stainless steel fasteners upon completion of hull painting.

12. PREPARATION OF VESSEL HULL FOR GRIT BLASTING

NOTE:
Care shall be taken to avoid damage to the CAPAC anodes and reference cells. The anodes are located at frame 54 port and starboard, both Ends, approximately nine (9) feet above the keel. The reference cell is located on the starboard side toward the No. 1 End.

A. Install protective covering on propellers, propeller bearings, exposed shafting, CAPAC anodes and reference cell, all through-hull penetration and entrance ways to protect and prevent grit blast material from causing damage or entering Vessel. Blank the main sea suction openings from the inside while the valves are removed for maintenance, so the valve mounting flange may be painted on the inside diameter. Conduct a pre-blast inspection with the WSF Inspector and the Vessel Staff Chief Engineer.

13. GRIT BLAST HULL

NOTE:
For bidding purposes, assume that 6,000 Square Feet (SF) of hull will require grit blasting to SSPC-SP 6, Commercial Blast Cleaning. Upon completion of hull grit blasting, the Contract will be adjusted upward or downward to account for the actual scope of grit blasting authorized by the WSF Inspector.

A. Grit blast areas of abrasion, corrosion or steel repairs on the hull from the top flat surface of the rub rail down to the keel, including flat keel, sea chest, strainer plates and rudders to SSPC-SP 6, Commercial Blast Cleaning.

B. The anti-fouling coating, for at least two (2) inches bordering the blasted area, shall be removed to existing ANTI-CORROSIVE COATINGS and feathered to a smooth surface.

14. ANODE AREA CAPASTIC REPLACEMENT

NOTE:
For bidding purposes, assume that 25 square feet of failed capastic will require repair. The capastic shall be applied to a minimum thickness of 1/8 inch in the area of the shield out from the faired in area around the anode.

A. Provide labor, material, and equipment to renew capastic around the CAPAC anodes using 'Capastic' epoxy troweling compound made by ELECTROCATALYTIC, INC.

B. Build up a minimum of 22 mils DFT of epoxy Anti-Corrosion coating over the capastic areas and the secondary dielectric shield areas.

15. PAINTING OF VESSEL HULL, ANTI - CORROSION COATING

NOTE:
For bidding purposes, assume that 6,000 SF of the hull will require the ANTI-CORROSIVE COATINGS. The Contract will be adjusted upward or downward, using the square footage determined in Work Item 13.

A. Furnish and apply one (1) coat of INTERNATIONAL Intertuf 262 Series epoxy, Red, to obtain a minimum of 5 mils (DFT) to surface areas prepared in Work Item 13.

B. Furnish and apply one (1) coat of INTERNATIONAL Intertuf 262 Series epoxy to obtain a minimum of 5 mils (DFT) of contrasting color to all surfaces painted in paragraph "A" of this Work Item.

16. PAINTING OF VESSEL HULL, BELOW WATERLINE ANTI - FOULING

NOTE:
For bidding purposes, assume that 4,000 SF of the hull will require the first coat of ANTI-FOULING COATINGS. The Contract will be adjusted upward or downward, using the square footage determined in Work Item 13.

A. Furnish and apply one (1) coat of INTERNATIONAL Interviron BRA Series anti-fouling, Red, to obtain a minimum of 5 mils (DFT) to all surfaces painted below the waterline in Work Item 12.

17. PAINTING OF VESSEL HULL, BELOW WATERLINE ANTI – FOULING (FULL COAT)

A. Furnish and apply one (1) full coat of INTERNATIONAL Interviron BRA Series anti-fouling, Black, to obtain a minimum of 5 mils (DFT) to all surfaces of hull below the waterline.

18. DRAFT MARKS

A. Repaint all draft marks and underwater hull markings, using INTERNATIONAL Intergard Epoxy Acrylic FT Series, White.

19. PAINTING OF VESSEL HULL, ABOVE THE WATERLINE

NOTE:
For purpose of bidding assume that 2,000 Square feet of hull above the waterline will require painting. The Contract will be adjusted upward or downward using the square footage determined in Item 13.

A. Furnish and apply one (1) coat of INTERNATIONAL Intergard Epoxy Acrylic FT Series, Medium Green, to obtain a minimum of 2 mils (DFT).

B. Furnish and apply one (1) coat of INTERNATIONAL Intertuf 262, Series epoxy, Black, to obtain a minimum of 5 mils (DFT) to the entire guard.

20. NO. 1 AND NO. 2 PROPELLER HUB CHANGEOUT

A. Provide labor, material and equipment to erect and remove staging in area around the No. 1 and No. 2 End propeller hubs to accomplish all affiliated work. Remove the No. 1 and No. 2 End propeller hubs, and replace with WSF furnished units.

NOTE:
The intent of this specification is to replace the existing propeller hubs with new Rolls-Royce Marine (Ulstein) hubs. The new hubs have been designed to make up to the existing tailshaft and oil control tubes, using new, Contractor furnished hub bolts and propeller blade bolts. WSF will furnish the services of a Rolls Royce Marine service rep to assist in the hub changeout and testing.

B. Prior to disassembly, cycle the blades to check for freedom of movement, the time to pitch and feather, and for any leaks, in the presence of the Vessel Staff Chief Engineer, the WSF Inspectors, and the Rolls-Royce

Marine representative. Draw oil samples as directed by the Vessel Staff Chief Engineer and the Rolls-Royce Marine representative.

C. Drain No. 1 and No. 2 End outboard stern seal units, and dispose of oil in accordance with all applicable local, State and Federal rules, laws, and regulations.

D. Have the Vessel's crew pitch the propellers to the full ahead position. Drain and dispose of the oil from the propeller shaft bearings. Drain and dispose of the oil from the propeller shaft by removing plugs from the hubs. All oils shall be deposed of in accordance with all applicable local, State and Federal rules, laws, and regulations.

E. Remove the rope guards. Remove the clamp ring from the inboard seal liners, and clamp the liners into position so it is not displaced from its running position with the seal housings. Provide rigging support for the inboard End of the tail shaft. Set up to capture any oil present in the coupling prior to splitting the coupling.

F. Disconnect the SKF tail shaft coupling, and drift the coupling out enough to allow the oil tubes to be uncoupled. Disconnect the tail shaft portion of the oil tubes from the intermediate section. Disassemble the O.D. Box portion of the oil tubes enough to allow all of the oil tubes to be withdrawn, if necessary.

NOTE:
The Contractor is reminded of the shaft grounding assembly in the No. 1 and No. 2 End Tank Rooms which will require lifting of the grounding brushes prior to any drifting of the stern shaft assembly. Any damage caused by failure to raise the brushes and protect the assembly shall be repaired at the Contractor's expense.

G. Remove all propeller blades from the hubs. Remove the End plate from the hubs, and disconnect the oil tubes from the propeller control rods. Push the seal liners and bolt covers forward, and remove the hub mounting bolts. Remove the propeller hubs from the tail shaft using the WSF furnished lifting fixture. Protect the propeller hubs from contamination.

H. Perform a magnetic particle inspection of the tail shafts in way of the hub mounting flange, holes and radius. Submit three (3) copies of a written report of the findings to the WSF Inspector.

I. Provide labor, material and equipment to open and clean system sump, piping and hoses to the satisfaction of the Vessel Staff Chief Engineer.

J. Provide labor, material and equipment to transport and load the hub removal and disassembly tools from WSF storage facility to the Vessel. Upon completion of all work and training transport to WSF storage facility.

K. Provide labor, material and equipment to transport and load the new hubs from Rolls Royce storage facility to the Vessel, provide a clean inside storage if not going directly into the Vessel. Upon completion of all work and training, shrink wrap removed hubs and clearly mark on the wrapped hubs the hub removal date. Transport removed hubs to WSF Harbor Island storage facility.

L. Install the new WSF-furnished propeller hubs, new WSF Hub Telescopic pipes (this pipe will be threaded, however, threads will be required to be dressed up to match existing oil pipe connection thread depth) and re-mount the propeller blades with new blade seals. Insure the negative terminal of the welding machine is grounded to the corresponding propeller blade when welding propeller bolt locking wires.

M. Upon completion of assembly of the Controllable Pitch Propeller System, and in the presence of the Vessel Staff Chief Engineer, and WSF and USCG Inspectors, verify the "A" dimension with the blades pitched to "Blade Tram" marks to ensure that each system is pitching properly.

N. At the start and completion of the CPP work, the Contractor shall provide the pumping and cleaning of all bilge in areas affected by the Work.

O. Load WSF furnished oil on board. Refill the shaft and propeller system with the WSF furnished oil.

P. Re-install the rope guards. Re-assemble the inboard and outboard seals, and align the liners to within .005” T.I.R. on both the face and periphery. Demonstrate the proper alignment to the Vessel Staff Chief Engineer and the WSF Inspector.

Q. Fill the rotating fairwater covers that protect the hub flange bolts with EP 0 food grade grease.

R. Re-install shaft grounding assembly.

21. TRAINING FACILITIES

A. Provide classroom facilities for twenty (20) students for one (1) day. Facilities should include seating for 20, a white board at least 6 ft. wide by 4 ft high and a screen suitable for projecting computer images.

B. Provide labor, material and equipment to transport the WSF "Training Hub" from a WSF Seattle facility to the Contractor's training facility, and return to WSF Seattle facility when training is completed. Provide a separate facility for hands on instruction for one (1) day. Facility will have the capability to lift and crib up one of the removed hubs into a vertical position for disassembly. Provide crane services to aid in disassembly.

22. NO. 1 AND NO. 2 PROPELLER HUB TESTING

A. Furnish labor, material and equipment, in support of the Rolls-Royce Marine rep, to test the No. 1 and No. 2 propeller hubs prior to undocking.

B. Cycle the blades to check for freedom of movement, the time to pitch and feather, and for any leaks, in the presence of the Vessel Staff Chief Engineer, and the WSF and USCG Inspectors. Draw oil samples as directed by the Vessel Staff Chief Engineer and the Rolls-Royce Marine representative.

NOTE:
For bidding purposes, assume 100 hours in support of on-dock testing and troubleshooting.

23. MARINE EVACUATION SYSTEM (MES) INSTALLATION

A. Provide labor, material, and equipment to install four (4) WSF-furnished Marine Evacuation Systems (MES) in accordance with **Attachment No. 3**, WSF Drawing No. 8300W-505-016-3, Rev. A, New Marine Evacuation Slides, Structural Mods and Installation Details.

B. Provide labor, material, and equipment to load and transport to the Contractor's facility four (4) Marine Evacuation Systems from the WSF warehouse located at 6000 Sixth Avenue South, Seattle, WA. The Contractor shall store the new units in a dry, covered environment at all times.

C. Provide labor, material, and equipment to clean and gas free the below deck compartments/areas affected by this Work Item as necessary, and obtain a Marine Chemist certificate for Safe for Men and Safe for Hot Work. Provide fire watches as required.

D. Note and map the location of all interferences prior to removal. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation. Interferences to be modified are identified on **Attachment No. 3**.

E. Provide labor material and equipment to modify curb and relocate mooring cleats at MES Stations 1 and 4 in accordance with **Attachment No. 3** and **Attachment No. 4**, WSF Drawing No. 8300X-399-02-1, Rev. D, Issaquah Class Cleat Foundation. All structural welds shall be inspected using a liquid penetrant method in the presence of WSF and USCG Inspector. Remove NDT dyes or media after inspection by USCG and/or WSF Representative, and before painting preparation.

F. Provide labor, material, and equipment to modify the curbing in way of the four (4) Marine Evacuation Systems' (MES) installations as shown on **Attachment No. 3**. These curbing modifications will include (but not be limited to): cutting back curbing and support structure in way of the MES; providing new support structure (similar to existing) at the new Ends of the curbing; cutting out curbing for new pipe guards, and installing new pipe guards.

G. Provide labor, material, and equipment to install new lifeline staples, similar to existing, on the curtain plate exterior at each side of the new MES openings. Cut the existing lifeline cable, terminate it with stainless steel End fittings similar to existing, and fasten it to the new staples.

H. Provide labor, material, and equipment to fabricate and install a bowsing system at each of the four (4) MES stations. Install chocks, staples, cleats, pulleys, and slit EPBM extrusions to fit bowsing lines supplied with MES.

I. Provide labor, material, and equipment to fabricate and install a slide retainer at each MES station including slide retainer stops and slotted slide retainer plates in accordance with **Attachment No. 3**.

J. Provide labor, material and equipment to apply a sealing coat of caulking compound to all disturbed flanged joints and curtain plate seams affected by this Specification. Caulking compound to be A.C. PRODUCTS Flexible Sealant, White.

K. Provide labor, material, and equipment to prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat, applied to a minimum of 6 mils (DFT) of AMERON Amercoat 235, and top coat with 2 mils (DFT) AMERON Amercoat 229 of proper color. Coat the exterior of each MES to match the exterior color scheme such that the appearance of the MES exterior blends into the curtain plate.

L. Present the MES installation to USCG for inspection.

24. MES SAFETY MARKING

A. Provide labor, material and equipment to apply safety markings in way of the four (4) Marine Evacuation System stations, as shown on **Attachment No. 5**, WSF Drawing No. 8300W-505-24-01, Rev. A, Issaquah Class Safety Markings and Painting for New Marine Escape Slides.

B. Provide labor, material, and equipment to grit blast the areas in way of these safety markings on the car deck to SSPC-SP6, Commercial Blast Cleaning. Upon completion of the work, clean out all deck drains, and demonstrate free flow of water in all deck drains to the WSF Representative.

NOTE:
If deck blaster equipment is used, ensure all shot is removed from all surfaces prior to coating.

C. Provide labor, material, and equipment to apply a coat of DEVOE (AMERON) Bar-Rust 235 haze gray, to all surfaces prepared in paragraph B to obtain a minimum of 6 mils (DFT).

D. Provide labor, material, and equipment to apply DEVOE (AMERON) Dev-grip 237M, Dark Gray, to the areas of paragraph C.

E. Provide labor, material, and equipment to apply a full coat of DEVOE (AMERON) Devran 229, Signal Yellow or Black stripes, as shown on Attachment No. 8, to obtain a minimum of 2 mils (DFT).

F. In addition to above, provide labor, material, and equipment to apply the letters “LEAVE 3 FOOT VEHICLE GAP” as shown on **Attachment No. 8**, Welin Lambie Manual, Technical Manual for Rescue Boat Davit Type SARB1.0F. These letters shall be a full coat of DEVOE (AMERON) Devran 229, Safety Red, to obtain a minimum of 2 mils (DFT).

25. MES SIGNAGE

A. Provide labor, material, and equipment to provide and install the Emergency Evacuation Slide Safety Warning Signage (Sign Type 2-A) in accordance with **Attachment No. 3 and Attachment No. 6,** WSF Dwg. 8300W-505-24-02, Rev. B, Signage Manual Emergency Escape Slide Signage Guidance.

B. Provide labor, material, and equipment to provide and install the Emergency Evacuation Slide Locking Bar Sign (Sign Type 3-A) in accordance with **Attachment No. 6**.

C. Provide labor, material, and equipment to provide and install the Emergency Evacuation Slide Signage at locations described in **Attachment No. 6**. Double-sided tape will not be used to attach signs. These attachments shall ensure that these aluminum plate signs are dielectrically isolated from the existing steel structure. Color schemes and fonts are detailed in **Attachment No. 6**.

26. EXISTING LIFESAVING EQUIPMENT REMOVAL

A. Provide all necessary labor, material, rigging and equipment to remove all the existing lifesaving equipment as described below from the Navigation Bridge Deck. The existing lifesaving equipment to be removed from the sides of the Navigation Bridge Deck includes the following: four (4) 15 person inflatable liferafts and three (3) 45 person inflatable life rafts.

B. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK" for same. Maintain the certificate during the course of the Work. Provide fire watches as required.

C. Provide labor, material, and equipment to load and transport the above, removed, existing lifesaving equipment to the WSF facility located at Eagle Harbor. The Contractor shall be responsible for the safe and proper removal, transporting, storage, loading and unloading of this existing lifesaving equipment including cradles.

D. Provide labor, material, and equipment to remove all existing life raft equipment support structure on top of (not under) the Navigation Bridge Deck. Grind smooth all scabs, sharp corners and rough edges down to the bare deck level.

E. Provide labor, material and equipment to apply a sealing coat of caulking compound to all disturbed flanged joints and curtain plate seams affected by this Specification. Caulking compound to be A.C. PRODUCTS Flexible Sealant, White.

F. Provide labor, material, and equipment to prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat, applied to a minimum of 6 mils (DFT) of AMERON Amercoat 235, and top coat with 2 mils (DFT) AMERON Amercoat 229 of proper color.

G. Provide labor, material, and equipment to apply DEVOE (AMERON) Dev-grip 237M, Dark Gray, to new or disturbed deck areas requiring application of non-skid.

27. RESCUE BOAT DAVIT INSTALLATION

NOTE:
The Contractor is cautioned, that there are poured transits located throughout the existing wireways on this Vessel. These transits are not to be disturbed. Any existing cables that are required to be removed from these poured transits shall be cut off at the nearest hanger on each side of the transit, leaving a short pigtail. The pigtail shall be sealed with a heat shrink boot, and the entire length of the cut cable running through the transit cable shall be painted RED. If new transits are required to complete the installation, they shall be Nelson MCT's.

A. This installation will require USCG inspection. The Contractor is responsible for scheduling arrangements for all USCG inspections.

B. Provide labor, material, and equipment to disconnect and remove existing rescue boat davits. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK" for same. Maintain the certificate during the course of the Work. Provide fire watches as required. Remove electrical boxes, and davit motor and hydraulics. Disconnect and remove existing rescue boats, boat gripes, cradles, fuel lockers, and boat motors. Transport the removed davits including motors and hydraulic components, boats, motors, and gripes to WSF facility. Construct a shipping cradle or cribbing suitable for safe movement of the removed davits.

C. Provide labor, material, and equipment to remove existing vandalism barrier including existing handrails/liferails. Provide labor, material, and equipment to remove all unused structural attachments on top of passenger deck, cabin bulkheads, and under side of solarium. Existing

non-poured bulkhead and deck penetrations may be reused. Existing cable penetrations which are not to be reused will be cut off and blanked. New penetrations shall maintain the watertight and fire ratings of the boundaries penetrated. Existing davit electrical power cables will be pulled back to panel EP1 located in Engineer's Control Room and scrapped. Existing rescue boat station lighting circuits and fixtures are to be retained and not removed. The lighting fixtures on existing davit arms are to be removed and retained. Grind smooth all sharp corners, scabs, and rough edges down to level of underlying structure.

D. Provide labor, material, and equipment to remove solarium structure number 1 and 2 Ends as depicted in **Attachment No. 7**, WSF Dwg. 8300W-505-16-2, Rev. F, Issaquah Class Rescue Boat, Installation Arrangement and Details. Grind smooth all sharp corners, scabs, and rough edges.

E. Provide labor, material and equipment to install two (2) WSF-furnished Welin Lambie rescue boat davits (the davits) and two (2) WSF supplied Zodiac Hurricane rescue boats and outboard motors in location shown on **Attachment No. 10**, WSF Dwg. 8300W-505-95-01, Rev. D, Issaquah Class New Marine Evacuation Slides Emergency Communications Phone System Circuit "4JV". The Contractor shall load and provide transportation of the davits, rescue boats, and motors from the WSF facility to the job site. Construct a shipping cradle and/or cribbing suitable for safe movement of the Welin Lambie davits.

F. Provide labor, material and equipment to modify solarium structures and deck drains number 1 and number 2 Ends in accordance with **Attachment No. 7**.

G. Provide labor, material and equipment to modify under passenger deck structure number 1 and 2 Ends in accordance with **Attachment No. 7**. Pay particular attention to foundation location. Attach davits to the davit stools and locate the stool over new foundation such that the at rest davit location positions the davit hook over the pick point of the rescue boat. When the stool location is properly determined, weld davit foundation stools to deck in accordance with **Attachment No. 8**. Foundation stools may be trimmed to insure bolt circle is level. All davit under and above deck foundation welds are to be non destructively tested using magnetic particle or dye penetrant methods. Remove NDT dyes or media after inspection by USCG and/or WSF Representative, and before painting preparation.

H. Provide labor, material and equipment to install a hose bib on forward bulkhead of the passenger cabin within the rescue boat vandalism barrier No. 2 End. The supply to the bib shall be ½ inch galvanized pipe and

shall be piped from existing 1-1/4 inch fresh water line in the overhead of the passenger cabin. Piping shall be run behind existing joiner panels and above existing false overhead. Contractor is to exercise care when removing joiner panels as they are to be reused. Replace all damaged thermal insulation. The hose bib shall be of freeze proof type. Piping shall be suspended from hangers using hanger spacing similar to existing fresh water piping. Hydrostatically test new piping to working pressure, flush and chlorinate system. Provide appropriate certificates of disinfecting prior to completion of this Contract.

ASBESTOS WARNING: Existing joiner panels contain asbestos. Panels should be removed and reinstalled by personnel certified to work with asbestos. Use extreme care in removing and reinstalling to prevent release of panel core material into the atmosphere. Seal all edges and holes in removed paneling.

I. Provide labor, material and equipment to fabricate and install new movable rescue boat cradles to fit new rescue boats in accordance with **Attachment No. 9**, WSF Drawing No. 8000W-524-16-02, Rev. C, Fleetwide Zodiac Rescue Boat Cradle Installation, Arrangement and Details. Fabricate and install new boat gripes to fit new rescue boat. Fabricate and install new chocks in accordance with **Attachment No. 9**. Locate cradle in such a manner that when the boat rests in the cradle, the pick point of the boat is directly under the rescue boat davit hook when the davit is in the at rest position. Insure cradled boat does not interfere with sliding passenger gates in the fully open position. Outboard gripe attachment points must be located to permit slewing of rescue boat directly from cradle without lifting, and not to interfere with full opening of sliding passenger gates. Outboard chocks will be hinged to permit slewing of rescue boat directly from cradle without lifting in accordance with **Attachment No. 8**.

J. Provide labor, material and equipment to fabricate and install two eyes for ladder centered on rescue boat in launch position (in vicinity of FR's 44 and 45) as designated by WSF Inspector. Provide labor, material and equipment to fabricate and install two cleats suitable for attaching rescue boat painter on each End of each rescue boat opening as designated by WSF Inspector (total 4 cleats). Provide and install rescue boat painter which reaches from rescue boat in stowed position to cleats at rescue boat opening.

K. Provide labor, material, and equipment to fabricate and install two rescue davit operating instruction signs in accordance with **Attachment No. 8**. Instruction signs shall be fabricated on red phenolic with white lettering and diagrams. The sign shall be 18 inches high and 24 inches wide. WSF will provide Operating Instructions as a computer file in TIF

format. Signs will be mounted in a location designated by the WSF Inspector using 316 stainless steel hardware and fasteners.

L. Provide labor, material, and equipment to prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat, applied to a minimum of 6 mils (DFT) of AMERON Amercoat 235, and top coat with 2 mils (DFT) AMERON Amercoat 229 of proper color.

M. Provide labor, material, and equipment to apply DEVOE (AMERON) Dev-grip 237M, Haze Gray, to new or disturbed deck areas requiring application of non-skid.

N. Provide labor, materials and equipment to prepare for operation and commission the rescue boat davit in accordance with **Attachment No. 8**. Preparation for operation includes performing all maintenance inspections and activities listed in Attachment No. 8 including draining and refilling gear box and hydraulic fluid.

CAUTION: After all electrical connections are complete, before any operation of the davit, it is essential that the isolator is switched on and left on for no less than 48 hours to insure the anti-condensation heaters dry out the control panel. Failure to do this can result in damage to electrical components. Check control panel for moisture before commencing operation. Once the control panel is dried out, the panel isolator must be left on to power the anti-condensation heaters and accumulator automatic charging system.

O. Test the davit to USCG requirements and the requirements of **Attachment No. 8** to the satisfaction of the WSF and USCG Inspectors.

28. RESCUE BOAT VANDALISM BARRIER.

A. Provide labor, material, and equipment to install new vandalism barrier in accordance with **Attachment No. 7**. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK" for same. Maintain the certificate during the course of the Work. Provide fire watches as required. All attaching hardware, screen retaining flat bar, and mounting clips shall be 316 stainless steel. Pipe screen frame shall be galvanized.

B. Provide labor, material, and equipment to prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat, applied to a minimum of 6 mils (DFT) of AMERON Amercoat 235, and top coat with 2 mils (DFT) AMERON Amercoat 229 of proper color.

C. Provide labor, material, and equipment to apply DEVOE (AMERON) Dev-grip 237M, Haze Gray, to new or disturbed deck areas requiring application of non-skid.

29. MARINE EVACUATION SLIDE AND RESCUE BOAT DAVIT EMERGENCY COMMUNICATIONS

NOTE:
The Contractor is cautioned, that there are poured transits located throughout the existing wireways on this Vessel. These transits are not to be disturbed. Any existing cables that are required to be removed from these poured transits shall be cut off at the nearest hanger on each side of the transit, leaving a short pigtail. The pigtail shall be sealed with a heat shrink boot, and the entire length of the cut cable running through the transit cable shall be painted RED. If new transits are required to complete the installation, they shall be Nelson MCT's.

A. Provide labor, material, and equipment to install a Marine Evacuation Slide and Rescue Boat Davit System Emergency Communication Phone System in accordance with **Attachment No. 9.**

B. Mount a phone unit in each Pilothouse in a location designated by the WSF Inspector.

C. Mount a phone unit in the vicinity of the new Rescue Boat Davits, in accordance with **Attachment No. 4**.

D. Mount a phone unit at each evacuation slide station located on the vehicle deck in accordance with **Attachment No. 3**. Locate the Phone Units in such a way that the existing curtain plate framing will protect the unit from moving traffic. The Phone Unit shall be bolted to a backing plate with Contractor furnished 316 stainless steel fasteners. Attach the backing plate to the existing Curtain Plate Framing. Phone bells shall be mounted 8 ft above the deck.

E. Existing deck and non-poured bulkhead penetrations may be used where feasible. New penetrations shall maintain the watertight and fire ratings of the boundaries penetrated.

F. Provide labor, material, and equipment to fabricate and install warning labels and station directory plates in accordance with **Attachment No. 9**.

G. Provide labor, material and equipment to apply a sealing coat of caulking compound to all disturbed flanged joints and curtain plate seams affected by this Specification. Caulking compound to be A.C. PRODUCTS Flexible Sealant, White.

H. Provide labor, material, and equipment to prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat, applied to a minimum of 6 mils (DFT) of AMERON Amercoat 235, and top coat with 2 mils (DFT) AMERON Amercoat 229 of proper color.

NOTE:

WASHINGTON STATE FERRIES ELECTRICAL INSTALLATION SPECIFICATION

(ATTACHMENT NO. 11)

Details of all electrical installations shall be in accordance with Attachment No. 11 unless otherwise specified in this Specification.

30. MARINE EVACUATION SLIDE AND RESCUE BOAT STATION LIGHTING

NOTE:

The Contractor is cautioned, that there are poured transits located throughout the existing wireways on this Vessel. These transits are not to be disturbed. Any existing cables that are required to be removed from these poured transits shall be cut off at the nearest hanger on each side of the transit, leaving a short pigtail. The pigtail shall be sealed with a heat shrink boot, and the entire length of the cut cable running through the transit cable shall be painted RED. If new transits are required to complete the installation, they shall be Nelson MCT's.

A. Provide labor, material, and equipment to install six (6) each fluorescent fixtures, GLAMOX No. GLINR 2/32-T8-PC 1/6 with a NEMA 4X enclosure, and relocate two (2) existing fixtures in accordance with **Attachment No. 12,** WSF Drawing No. 8300W-505-92-01, Rev. E, Issaquah Class New Marine Evacuation Slides Lighting Mods. Note that new lights are to be mounted above MES signage. Mount the fixture to new brackets to be attached to the existing curtain plate framing. The fixture brackets shall be mounted in a way that will protect the lighting fixture from moving traffic. Attach the fixture to the brackets with Contractor furnished 316 stainless steel fasteners. New Contractor-furnished and installed fluorescent light fixtures shall be fitted with MAGNETEK Electronic Ballast, Model B232I120RH.

Inside each new fixture equipped with a MAGNETEK ballast, install a label plate inscribed as follows:

ATTENTION

LAMP: F32T8 OR F17T8 (AS APPROPRIATE)

BALLAST: MAGNETEK TRIAD, B232I120RH

NO SUBSTITUTES

B. Connect each new lighting fixture to the nearest existing emergency lighting fixture using LSDSGU-4 cable. Each new light fixture for the emergency lighting system shall have a red "E" label plate with the emergency lighting circuit number engraved to indicate the fixture is powered by an emergency circuit.

C. Relocate flood lights removed from davits by Item 27 to navigation bridge deck in location designated by WSF Inspector.

D. Provide labor, material, and equipment to install four (4) each strobe light fixtures, Federal Signal Model 371DST with a NEMA 4X enclosure as shown on **Attachment No. 13,** WSF Dgw. 8300W-505-92-02, Rev. A, Issaquah Class New Marine Evacuation Slides, Strobe Lights. Install one (1) strobe light fixture near each Evacuation Slide located on the Vehicle Deck. Mount the fixture to brackets that are attached to the existing Curtain Plate Framing. The fixture brackets shall be mounted in a way that will protect the fixture from moving traffic. Attach the fixture to the brackets with Contractor furnished 316 stainless steel fasteners. Fixture location shall be near each Evacuation Slide as shown on **Attachment No. 13**.

E. Provide labor, material, and equipment to install one (1) three way switch and one (1) "ON" indicator light in each pilothouse console. Mount the switch and indicator light in a location designated by the WSF Inspector. Fabricate and install label plates on each pilothouse console in accordance with of **Attachment No. 13**.

F. Provide labor, material, and equipment to prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat, applied to a minimum of 6 mils (DFT) of AMERON Amercoat 235, and top coat with 2 mils (DFT) AMERON Amercoat 229 of proper color.

31. RESCUE BOAT DAVIT POWER SYSTEM MODIFICATIONS AND BATTERY CHARGER

NOTE:
The Contractor is cautioned, that there are poured transits located throughout the existing wireways on this Vessel. These transits are not to be disturbed. Any existing cables that are required to be removed from these poured transits shall be cut off at the nearest hanger on each side of the transit, leaving a short pigtail. The pigtail shall be sealed with a heat shrink boot, and the entire length of the cut cable running through the transit cable shall be painted RED. If new transits are required to complete the installation, they shall be Nelson MCT's.

A. Provide labor, material and equipment to install two (2) new rescue boat davit power systems and rescue boat battery charging systems in accordance with **Attachment No. 7** and **Attachment No. 14**, WSF Dgw. 8300W-536-91-01, Rev. E., Issaquah Class Rescue Boat Installation, Rescue Boat Electrical Power. Connections to boat davits must be flexible and allow for approximately 70 davit radial movement. Existing non-poured bulkhead and deck penetrations may be reused. Existing cable penetrations that are not to be reused will be cut off and blanked. New penetrations shall maintain the watertight and fire ratings of the boundaries penetrated.

B. Locate battery charging terminal boxes inboard or forward of rescue boats so as not to interfere with slewing of rescue boats directly from cradle without lifting. Proposed terminal box location shall be approved by WSF Inspector.

C. Connect existing davit remote operators located at lower vehicle rescue boat debarkation stations to new davits.

D. Provide labor, material and equipment to fabricate and install foundations for battery chargers in spaces designated in **Attachment No. 14**. WSF Inspector will designate specific location within the space.

E. Provide labor material and equipment to pull back existing davit power cable to breakers 9EP1 and 10EP1 located in panel EP1, remove the breakers and turn over to Staff Chief Engineer. Provide labor, material and equipment to install new breakers and cabling in accordance with **Attachment No. 14**.

F. Use of existing non-poured bulkhead and deck penetrations is permitted if locations do not interfere with operation of davit or slewing of the rescue boat. New penetrations shall maintain the watertight and fire ratings of the boundaries penetrated.

CAUTION: After all davit electrical connections are complete, before any operation of the davit, it is essential that the isolator is switched on and left on for no less than 48 hours to insure the anti-condensation heaters dry out the control panel. Failure to do this can result in damage to davit electrical components. Check control panel for moisture before commencing operation. Once the control panel is dried out, the panel isolator must be left on to power the anti-condensation heaters and accumulator automatic charging system.

G. Fabricate and install new rescue boat circuit breaker labels. Material and lettering shall be similar to existing emergency switchboard breaker labels.

H. Provide labor, material, and equipment to prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat, applied to a minimum of 6 mils (DFT) of AMERON Amercoat 235, and top coat with 2 mils (DFT) AMERON Amercoat 229 of proper color.

I. Provide labor, material, and equipment to apply DEVOE (AMERON) Dev-grip 237M, Haze Gray, to or new disturbed deck areas requiring application of non-skid.

32. SERVICING AND INSPECTION OF CO2 SYSTEM

A. Furnish labor, material and equipment to inspect and test the Vessel's CO2 fire fighting system in accordance with the requirements for a USCG 12 year periodic inspection.

B. Obtain the services of a Coast Guard accepted/qualified vendor for the above work. Work is to include a hydrostatic test of all CO2 bottles, recharging as necessary, and re-certifying bottles and system.

C. Return the CO2 system to a fully functioning, complete system following the above work. Test the system to the satisfaction and acceptance of the USCG and WSF Inspector and the Vessel Staff Chief Engineer.

33. GAUGE VESSEL STEEL

NOTE:
The Contractor shall provide the WSF Inspector one (1) preliminary copy of the hull gauging report 24 hours after the readings are compiled. This will provide information as to any additional steel repairs that may be needed prior to the Vessel departing.

A. Provide labor, material and equipment to perform a Vessel Plating Gauge Survey and written report of the Vessel's steel plating thickness. The locations of all NDT shots shall be laid out by the Contractor and approved by the WSF Preservation Project Engineer and the WSF Inspector. Shot quantities, and general locations shall be in accordance with the table below. The survey shall be performed in the presence of the WSF Inspector and the attending USCG Inspector.

B. The readings shall be taken from the exterior of the hull, deck, and superstructure where possible when the Vessel is in dry-dock. Provide man lifts capable of reaching all portions of the hull, from the keel to the guard. Remove and restore paint in areas affected by this work.

Shot Area	Shot Qty
Keel Plating	20
The three Girth Belts (includes Vehicle Deck in way of Belt) at FR 30 #1 End Fr 0 and FR 30 #2	60 each Belt 180 total
Port and Starboard wind and water line Strakes, full length of the Vessel	100
Vehicle Deck and Superstructure	50
Suspect Areas	30
Total	380

C. Operators of NDT equipment shall be thoroughly familiar with the equipment being used and shall be properly qualified by training and experience to perform the necessary calibrations and tests, and to interpret and evaluate the test readings in accordance with this Section of the Specification. When requested by the WSF Inspector, the Contractor shall provide evidence of such training and certification.

D. Ultrasonic testing shall be conducted utilizing pulse-echo ultrasonic equipment. Ultrasonic equipment shall be calibrated to ensure an accuracy of ± 0.005 inches and have current calibration certification. Equipment qualification shall be in accordance with MIL-STD-271F.

E. At the conclusion of this survey, the Contractor shall produce a Vessel Plating Gauge Survey Report. The report shall be developed using a tabular format and include sketches indicating, for all readings, location by strake identification, original plate thickness, actual gauge reading, average thickness, and percent wastage for all plating surveyed. The Contractor shall produce the document using a Word for Windows® or Excel®, version or later format for tables and attach location draftsperson quality sketches to support the tables. All pages shall be numbered, with headers and footers, and have all tables and sketches cross-referenced for clarity. The Contractor shall provide five (5) paper copies and an exact copy on 3½ inch DS/HD magnetic media to the WSF Inspector, and one (1) paper copy to the Staff Chief Engineer prior to Vessel redelivery to WSF.

34. DOCK TRIALS

A. The Contractor shall provide support services for Dock Trials, to be conducted by the Vessel personnel.

B. The Dock Trials of the propulsion controls shall be under the direction of the Vessel Staff Chief Engineer and to the satisfaction of the Rolls-Royce Marine representative and the USCG Representative. **Attachment No. 15**, New Rolls Royce CPP Propeller Hubs, Dock and Trail Agenda and Record Sheets, will be used in conjunction with this testing.

NOTE:
For bidding purposes, assume 100 labor hours will be required in support of the Dock Trial. The Contract will be adjusted upward or downward, using the actual hours expended.

35. SEA TRIALS

A. The Contractor shall provide support services for Sea Trials, to be conducted by the Vessel personnel.

B. The Sea Trials of the propulsion controls shall be under the direction of the Vessel Staff Chief Engineer and to the satisfaction of the Rolls-Royce Marine representative and the USCG Representative. **Attachment No. 15** will be used in conjunction with this testing.

NOTE:
For bidding purposes, assume 50 labor hours will be required in support of the Sea Trial. The Contract will be adjusted upward or downward, using the actual hours expended.

(END)